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ABSTRACT

Four portfolio managers who handle common stocks were observed in a study that examined the preference of an alternative decision making process in an information overload situation. The week of observation was arranged so that the portfolio manager focused primarily on the decision making portion of the work rather than on the presentation and defense of decisions within the organization. During the observation, everything the portfolio managers did, every type of person with whom they interacted, the topics of every conversation, and the subject of every item read were recorded as well as when it occurred and the time spent in each activity. The data were then categorized and analyzed in three major ways: in terms of the portfolio managers' managerial functions, in terms of the information they acquired, and in terms of the decisions they made. Results showed relatively short amounts of time being spent in decision making, particularly considering the importance of their decisions. Furthermore, there was no sign of any use of a consciously logical sequence of steps in decision making. The amount of information available to the portfolio managers was massive, and the information flow was fast paced and highly fragmented. Yet, the portfolio managers showed no signs of information overload and only minimal attempts at overt filtering. These results suggest the possibility that an alternative mode of decision making does exist and may be preferable where there are massive amounts of information readily available. (HOD)

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The Information Acquisition Style and Decision-Making Mode Of High-Level Managers in an Information Rich Environment

Recently, a great deal of discussion has focused on the possibility of a decision-making mode other than traditional, consciously logical decision-making sequence. This is a report of an observational study which supports the existence of such an alternative mode. Suggestions are made concerning its most appropriate use and how it relates to the traditionally accepted mode of decision-making.

The Information Acquisition Style and Decision-Making Mode of High-Level Managers in an Information Rich Environment

Over the years of thinking about and studying managerial decision-making, a consciously logical sequence of steps has generally been agreed upon as the preferred method of making decisions. The steps of: 1) identifying the problem, 2) gathering information; 3) developing alternatives; 4) studying the impact of the various alternatives, and 5) selecting a solution, have become the accepted procedure. Recently, however, a number of articles have been published suggesting that this view of managerial decision-making is too narrow and that another mode of decision-making is operating and, at times, may be preferable to the traditionally accepted decision-making sequence.[1]

For this report one type of situation where an alternative decision-making process might be particularly useful was selected. Its distinguishing characteristics are: a situation where massive amounts of information are readily available, where much of the information's validity can not be objectively determined, and where both the information itself and its validity are constantly changing. Such a situation would likely be viewed by traditional information processing theorists as an information overload situation where the decision-maker becomes increasingly dysfunctional or, if the decision-maker is highly trained in the subject area, a situation where a very sophisticated

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[1]Henry Mintzberg, "Planning on the Left Side and Managing on the Right," Harvard Business Review, 54 (July-August 1976), p. 49-58. Richard Tanner Pascale, "Zen and the Art of Management," Harvard Business Review (March-April 1978), p. 153-162. James S. Williams, "Inference and the Bicameral Mind," Finance Magazine (August 1977), p. 6-8, 36. Robert Doktor and David M. Bloom, "Selective Lateralization of Cognitive Style Related to Occupation as Determined by EEG Alpha Asymmetry," Psychophysiology 14, (July 1977), p. 385-87. Dudley Lynch, "The Case for Disorderly Conduct: How to Get the Most Out of Managerial Man-power," Management Review (February 1980), p. 15-19.

filtering system is in operation. Yet, few observational studies had been made to record and analyze what actually happens in such "information rich" decision-making situations. This paper will report on one such observational study of a group of high-level managers while they were at work. The results will show that they showed no signs of dysfunction and only minimal use of any overt filtering techniques. The data will also indicate that what these managers do might be explained by an alternative decision-making mode and thus provide some additional data to support the existence this mode.

MANAGERIAL GROUP SELECTED:

The group of managers chosen were professional portfolio managers handling common stocks. There were two primary reasons for this selection. First, the stock market is one of the most information rich environments in America today. Perhaps the most visible manifestation of the magnitude of information available is the well-known ticker tape. In recent years the tape has been supplemented in the major investment offices with a system of Cathode Ray Tubes (CRT's). Besides trading and basic financial information, a vast amount of factual and analytical information is available on which the investor's buy and sell decisions can be based. Slovic states: "In no other realm are such vast quantities of information from such diverse sources brought to bear on so many important decisions. Careful accumulation and skilled interpretation of this information is said to be the sine qua non of accurate evaluation of securities."[2]

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[2]Paul Slovic, "Psychological Study of Human Judgement: Implications for Investment Decision-Making," The Journal of Finance, 27, No. 4 (Sept. 1972), P. 779-99.

The second major reason for selecting portfolio managers for observation was the nature of their jobs. The work of a portfolio manager is primarily to make decisions; other management roles such as leader or figurehead are not nearly as prevalent in their work. Thus, an observation of the portfolio managers' daily activities would provide a significant amount of data on the process of decision-making as it is done by professionals. Moreover, the nature of such portfolio decisions is similar in scope and importance to strategic decisions and so the findings of this analysis might be applicable in other situations. And finally, the decisions do not involve the added dynamics of managing personnnel in any significant fashion. This characteristic made both data gathering and analysis by the investigator less complex.

A situation was selected in which individual decision-making was the focus of portfolio management, and four volunteers were obtained for the study. The group of volunteers were all members of one organization, had spent their entire careers working in finance, and had been stock analysts earlier in their careers. Nevertheless, they displayed a wide diversity of individual and situational characteristics which might effect their decision-making styles. Their ages ranged from early thirties to late forties. Their time within the organization ranged from two to seventeen years. Two were Certified Financial Analysts (CFA's); two were not. They managed funds which varied from low to high risk, large to small, and dividend producing to equity appreciating. Finally, their theories of stock selection varied from a focus on specific stocks and the executives of the companies, to a focus on industries, to a focus on the larger economic picture, and to a technical focus on market performance.

A number of common characteristics were observed in the decision-making processes of these managers. While the small number of research subjects and the voluntary nature of the sample means that care must be taken when generalizing the results of the study, the validity of these process commonalities to a larger population seems more probable because of the diversity among the goals and decision-making principles of the subjects.

METHOD

The data for the study were gathered by a structured observation of the four portfolio managers for one week each. The method used was modelled after Henry Mintzberg's study of Chief Executive Officers which is reported in The Nature of Managerial work and elsewhere.[3] A pilot study had been conducted to determine the feasibility of gathering data in this setting by means of observation, and it also served to acclimate the subjects to the observer's presence and methods of gathering data. Weeks were chosen so that the portfolio manager would be focusing primarily on the decision-making portion of his work rather than presenting and defending his decisions within the organization. Also, the weeks of observation were staggered so the observer could rest.

The observer sat with each portfolio manager in his office and went with him each time he left his office to conduct business. The observer's stated desire was to be ignored and the entire organization had been made aware of this request. When outsiders visited the portfolio managers, the observer was briefly introduced, usually as an associate who was observing the

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[3]Henry Mintzberg, The Nature of Managerial Work (New York: Harper and Row, 1973).

work of the office. During the observation, everything the portfolio managers did, every type of person with whom they intereacted, the topics of every conversation, and the subject of every item read was recorded as well as when it occurred and the time spent in each activity. Supplementary information was gathered (with permission) by examining the materials on the portfolio manager's desks and waste baskets after working hours and by a post-observation interview conducted with each portfolio manager.

The data were then categorized and analyzed in three major ways: in terms of the portfolio managers' managerial functions, in terms of the information they acquired, and in terms of the decisions they made. The results reported here will focus on the decision-making process and how it related to the information acquired.

RESULTS

Since the focus of this report is on decision-making, the first results to be presented will concern the types of decisions which were made. This will provide a context in which to more easily analyze the data relating to information acquisition. The decisions were categorized in a system similar to the one developed by Mintzberg to describe managerial decision-making.[4] First, the conceptual category system will be described and then the time spent making each type of decision will be reported.

Mintzberg identified four major types of managerial decisions. The first is the entrepreneurial decision where the manager searches the organization and its environment for changes to improve his/her organization's position. For the portfolio managers, entrepreneurial decisions are the decisions to buy

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[4]Mintzberg, The Nature of Managerial Work, P. 92-3.

or sell stock. The second type of general managerial decision is the disturbance handling decision where the manager is responsible for the corrective action necessary when his organization faces a disturbance. In the portfolio management situation, this type of decision occurred occasionally when a portfolio manager's decision was brought under immediate review because of criticism from within the organization.

Resource allocation decisions are the third general type of managerial decision identified by Mintzberg and, in the situation being observed included three variations. These three variations were: 1)decisions made by two or more portfolio managers about using their combined resources to investigate some stock or industry, 2)the development of a "watch list" by each portfolio manager alerted others in their organization to the stocks they were interested in, and 3)any decisions related to stocks within the portfolio, e.g. reinvesting dividends, voting stock proxies, etc. A third type of resource allocation decision which was not directly observable as a decision was that of each individual portfolio manager concerning how to use his time. The results of these decisions were observable, however, and will be reported as the data related to information acquistion. The final type of general managerial decision identified by Mintzberg was that of negotiation. This type of decision occurred in portfolio management when the actual buy/sell price was arrived at in conjunction with organization's traders.

The percentage of work time observed to be spent on each of these types of decisions is reported in Table 1. The amount of time spent on entrepreneurial type decisions was determined by identifying the buy/sell decisions and then working back through the week to identify any time spent discussing the stock involved or any time spent analyzing the stock in relation

to other stocks or the manager's portfolio since any time spent in these activities might be identified as time during which information directly related to that decision was acquired. The time spent in disturbance handling and negotiation was for the most part accessible to the observer because it included interaction with other people. Furthermore, any time spent gathering information on the stocks to be discussed as part of disturbance handling was included in the time recorded as part of the process of decision-making. All the observable time spent in preparation for or interaction with others concerning resource allocation was also recorded.

The time spent in decision-making is startling in its relative brevity. While all the mental time used for decision making probably could not be observed, there is reason to believe that these figures are closer to reality than might be expected at first flance. The primary reason for this is that the portfolio managers were constantly busy doing other tasks; in other words, virtually no "free time" or "thinking time" which could have been used or private decision-making processes was observed. The average time per portfolio manager spent on unspecified functions was only .2 percent.

The twelve entrepreneurial and disturbance handling decisions where definite action was taken were analyzed further by examining the acquisition of information which was directly related in subject to the decision made and which, therefore, might have affected the decision. This analysis was done by reviewing the subject-listing chronology and the original observational notes, identifying all interactions about the stocks and - in one case - an industry, and writing down as much as appeared within the observational notes not only about the process but also about the general flow of the conversations which referred to it. This analysis revealed that the average number of contacts

which were observed before the decision was implemented was 2.75. This figure can be compared to the average number of times a stock already within the portfolio manager's portfolio was mentioned during the week, which averaged 2.95 times. The time spent on each decision was estimated as closedly as possible and found to be 18.4 minutes per decision. This average includes both disturbance handling decisions which usually involved group decision-making as well as individual decision-making. When these two types of decisions were caluclated separately, the disturbance handling decisions involved an average of 33.38 minutes per decision while the individual decision-making involved only 11 minutes per decision.

The expected, logical processess of decision-making were not observed. The portfolio managers were not observed specifically developing plans or strategies for the modifications of their portfolios, i.e. developing specific goals and then searching out information to make the specific decisions to implement their objectives. This statement is not meant to imply that they did not have general strategies or more specific goals for their portfolios, but rather that the process of implementing those goals did not seem to occur in an orderly sequence nor was information gathered for the decisions necessary for this implementation in some form of directed search. Furthermore, when a decision was made as a response to an opportunity (as it most often was during this observation) almost no checking of the total picture or comparisons among alternatives was observed, although in some cases reading of a single piece of mail on the subject occurred between the time the opportunity was presented and the decision was implemented. In only four of the twelve decisions was any information acquired on the stock after the buy/sell forms were completed. Generally, the nature of this contact was not to gather

information specifically about the stock, but rather to get some indication of what type of response to the decision could be expected from others in the organization. Finally, it should be noted that the most striking realization for the investigator was that the acquisition of information which led to a decision to act by an individual could not be differentiated from the general process of acquiring information except by the filling-out of the buy/sell forms which indicated tha a decision had been made.

Although the time spent working on specific decisions was relatively brief, the time spent gathering information was significantly larger. This process of acquiring information took an average of 63.3 percent of each portfolio manager's time (range = 16.3%), while the decision making time took only an average of 5.5 percent of their time (range = 6.26%). The information acquisition time was analyzed further in terms of how the information was acquired (eg. telephone, written material, face-to-face, etc.), who the information was acquired from, the time each contact involved, the general subjects of the information acquired, and the direction the portfolio manager gave to the acquisition of the information. Many of the resulting figures show wide variance among the four portfolio managers and will not be reported here. There were, however, some results which showed relative consistency among the portfolio mangagers and may identify general characteristics of information acquisition in this situation. Primarily, the highly consistent results concerned the general subject areas for which information was sought and the amount of contact time spent on each information was sought and the amount of contact time spent on each information gathering incident.

The subjects of the information acquisition have been categorized into four areas in Table 2. The first category, Portfolio Review, refers to

information that the portfolio managers gathered in order to be informed about developments within their own portfolios. It had three major components: 1)the review of stocks in industries held in the portfolio, 2)the monitoring of trades, and 3) the review of secondary information related to the portfolio, e.g., cash flow, tax considerations, or proxy information. The second area, Monitoring Market Movement involved keeping track of the market's general performance and included such things as reading/communication on that general subject initiated by the portfolio manager, using the Cathode Ray Tube in each portfolio manager's office to call up current information on non-portfolio stocks, and the time spent reviewing general market statistics such as those on the back inside page of the Wall Street Journal. The third general category in Table 2 is Scanning the Environment. This category includes time spent using stock/industry screens, scanning newspaper headlines or magazines, time spent in meetings where the purpose was for all members of the organization to exchange current information, and time spent sorting the mail. The fourth category, Reactive Information Acquisition, includes all the time spent observing and reacting to the daily flow of information concerning the changes in the stock market. The subject matter in this last category was not broken down further because the subjects were brought up in a random fashion and the time spent on each was impossible to determine with any specificity due to the method of observation.

Looking now at the time spent in each of these categories an interesting conclusion is suggested. Almost 60 percent of the portfolio managers' time was spent in reactive information acquisition, essentially daily scanning of the environment for change. Furthermore, of the 40 percent of time remaining, almost 30 percent of this time was spent in additional scanning procedures.

This brings the total time spent in scanning to an approximate average of 90 percent, with portfolio review comprising the other 10 percent of the information acquisition time. This finding is interesting primarily because of the lack of time spent on intensive study in any area, the kind of intensive study implied as necessary for the consciously logical mode of decision-making.

The final results to be reported complement the information on scanning by focusing on the amount of time spent in the various incidents of information acquisition. A gross subject analysis (e.g. identifying subjects as individual stocks, industries, or the economy in general) revealed that a different subject was dealt with on a average of every 1.75 minutes during the reactive information gathering time (i.e. during approximately 60 percent of the portfolio managers information acquistion time). Most of these subjects were stocks and industries (70.8%) with very little repetition of information. Another indication of the time spent per item of information is an analysis of the mail received. The average number of pieces of mail received per week was 516 and the average amount of time spent per item during the sort was .1455 minutes. From the weekly sort an average of 78.5 pieces of mail was saved and an average of 4.25 minutes spent reading each item selected. Finally, another view of the portfolio managers; information acquisition activities show that they spent an average of 4.3 minutes per phone call, 36 minutes per unscheduled meeting, 4.3 minutes per sitting at desk work, and 34.7 minutes per scheduled meeting. As these figues show, the information flow was very fast paced. Furthermore, the portfolio managers took very little time to rework the information once it was presented. For instance, although a number of them sometimes took notes during discussion, very seldom were these notes reviewed.

DISCUSSION:

This study is an attempt to systematically observe high-level managers making decisions in their work-place. It is a cumbersome and slow research methodology, and the small number of subjects makes quick generalizations risky. However, this type of study is necessary because it reports what is actually happening and allows researchers to check their assumptions about reality.

These high-level managers whose primary task was to make strategic management decisions spent the majority of their time gathering information. The amount of information which was available to them was massive. The information flow was fast pace and highly fragmented. Yet, the portfolio managers showed no signs of information overload and only minimal attempts at overt filtering. Had they felt the need, they could easily have managed themselves and the staffs available to them so that the information presented was limited by a filtering process and they would then have had more time for intensive study of a subject or decision, but they chose not to operate in this fashion. This behavior is not what would be expected given most of the literature on information processing[5] and indicates a mode of decision-making other than what has been traditionally described. Furthermore, the small amount of time usually spent on a piece of mail or on a specific topic during a conversation suggests that relatively small pieces of information are acquired on a subject at any one time. This finding brings into question the wisdom of hoping to catch the attention of these experts through long, logical argument.

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[5]G.A. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity to Process Information," Psychological Review, 63 (1956), p. 81-97.

The hypothesis of an alternative decision-making mode being used is supported by the findings relating directly to the entrepreneurial decisions which were observed. Analysis shows relatively short amounts of time being spent in decision-making, particularly considering the importance of these decisions. Furthermore, there was no sign of any use of a consciously logical sequence of steps in decision-making, such as a comparison of options or a use of pros vs. cons, either in terms of information sought or comments made by the portfolio manager. Again, this was not what would be expected given the traditional theories of decision-making.

Currently the best theory explaining the decision-making behavior observed here is what has become known in the popular literature as left brain/right brain theory. The medical researchers who have studied the phenomena in depth hypothesize the following characteristics of the right brain's mode of functioning: it is comparable in complexity and amount of activity to the left hemisphere[6], it uses images rather than words as a means of processing (although both understand words)[7], it can acquire larger amounts of information because of its imaging ability and its lack of need for sequential

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(cont.)

[6]Joseph E. Bogen, "The Other Side of the Brain I: Dysgraphia and Dyscopia Following Cerebral Commissurotomy," Bulletin of the Los Angeles Neurological Societies, 34, No. 2 (April 1969), p. 105.

[7]Alan Searleman, "A Review of Right Hemisphere Linguistic Capabilities," Psychological Bulletin, 84, No. 3 (1977), p. 522.

consideration of information[8], it can bridge gaps in information more easily[9], it processes information by means of developing patterns[10], and decisions are made by "synthesis"-either the pattern fits instantly or not at all.[11] Particularly, there is a direct match between these hypotheses and what was reported in this study in terms of the vast amounts of information the portfolio managers took in and the instanteous nature of their decisions. However, a complete comparison of their behavior shows other parallels as well.[12]

It should be added that this alternative mode of thinking does not completely replace the consciously logical mode of thought but rather compliements it and expands our understanding of the capacity of the brain. As W.S. Howell has pointed out, the two hemispheres of the brain work together holistically in high-level decision-making to make superior decisions.[13] We are not talking about unschooled intuition here, but rather about trained intuition (the portfolio managers had spent long years in the investment business building

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[8]W.D. Ten Houten and C.D. Kaplan, Science and Its Mirror Image: A Theory of Inquiry (New York: Harper and Row, 1973), p. 25.

[9]David Galin, "The Two Modes of Consciousness and the Two Halves of the Brain," in Symposium on Consciousness, Proceedings of the Annual Meeting of the American Association for the Advancement of Science, February 1974, (New York: Penguin Books, 1976), p. 30.

[10]Ten Houten and Kaplan, Chp. 1.

[11]Ten Houten and Kaplan, p. 14 and Michael Polanyi, The Tacit Dimension (Garden City, N.Y.: Anchor Books, 1967), p. 10 as cited in Ten Houten and Kaplan, p. 21.

[12]Sally J. Power-Ross, "External and Internal Processes in the Acquisition of Information and Decision-Making by Portfolio Managers, "Diss. University of Minnesota 1979, p. 148-178.

[13]William S. Howell, The Empathic Communicator (Belmont, Calif.: Wadsworth Publishing Company, 1982), p. 88-109.

up experience - i.e. patterns about how that world of finance works), checked and supported by traditional logic.

To conclude by returning to the opening questions: Does an alternative mode of decision-making exist? And if so, when does its use seem most useful? This study has shown that the possibility of an alternative mode of decision-making does exist and gives some indication of the general characteristics which may identify situations in which this mode is most useful. Specifically, the hypothesis suggested is that this mode of thinking may be preferable for decisions where there are massive amounts of information readily available, where much of the information's validity cannot be objectively determined, and where both the information itself and its validity are constantly changing, and where professionals with significant amounts of experience in the decision-making context are available.

TABLE 1: THE TIME SPENT IN DECISION-MAKING BY EACH PORTFOLIO MANAGER AS A PERCENTAGE OF TOTAL WORK TIME

	Portfolio Manager					
	#1	#2	#3	#4	Ave.	Range
Type of Decision:						
Entrepreneur	2.8	1.2	.4	1.5	1.5	2.4
Disturbance Handling	2.0	4.3	0	0	1.6	4.3
Resource Allocation	2.2	.1	.04	2.6	1.2	2.56
Negotiation	.6	.8	.9	2.4	1.2	1.8
TOTALS	7.6	6.4	1.34	6.5	5.5	6.26

TABLE 2: THE PERCENTAGE OF INFORMATION ACQUISTION TIME SPENT GAINING INFORMATION ABOUT VARIOUS SUBJECTS BY EACH PORTFOLIO MANAGER

	Portfolio Manager					
	#1	#2	#3	#4	Avg.	Range
Subject Content:						
Portfolio Review	8.8	6.4	13.5	12.6	10.3	7.1
Monitoring Market Movement	14.3	3.2	7.6	3	7	11.3
Scanning the Environment	17.3	25.9	20.9	29.1	23.3	11.8
Reactive Information Acquisition	59.6	64.5	58	55.3	59.4	9.2
TOTALS	100	100	100	100		